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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JASON A. A. WEST, THIMOTHY J. SHEPODD,
STEWART K. GRIFFITHS, RONALD F. RENZI, and
BOYD J. WIEDENMAN

Appeal 2010-002425
Application 10/701,097
Technology Center 1700

Before CHUNG K. PAK, BEVERLY A. FRANKLIN, and
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL¹

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the “MAIL DATE” (paper delivery mode) or the “NOTIFICATION DATE” (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

Appellants appeal under 35 U.S.C. § 134 the final rejection of claims 1-114. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b).

We AFFIRM.

Appellants describe a microfluidic chip that provides high throughput having a microarray capable of fluid communication with a functionalized porous polymer monolith (Spec. para. [0008]). The microarray and functionalized monolith features are described as enabling a reduction in sample preparation time, a reduction in required sample volume, an increase in sensitivity, and decreased sample degradation. *Id.*

Claim 1 is illustrative:

1. A microfluidic chip, comprising:

a plurality of vias;

a functionalized porous polymer monolith capable of being in fluid communication with at least one of said vias;

a microarray capable of being in fluid communication with said functionalized porous polymer monolith,

the microarray situated within at least one microchannel, the microchannel being characterized as having depth in the range of from about 1 micron to less than 10 microns, and;

an observation port through which at least one target disposed within said microarray is capable of being detected.

Appellants seek review of the following rejections:

1. Claims 1-11, 55-64, 66, 68-77, and 111-114 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mathies (US 2004/0209354 A1 published Oct. 21, 2004) in view of McNeely (US

- 2004/0037739 A1 published Feb. 26, 2004) and Quake (US Patent 6,833,242 B2 issued Dec. 21, 2004).
2. Claim 16-25, 31-44, 47² and 51-54 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mathies in view of McNeely, Quake, and Schembri (US Patent 6,875,620 B1 issued Apr. 5, 2005).
 3. Claims 12-15, 19, 25-35, 43-46, and 48-54 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mathies in view of McNeely, Quake, and Yamamoto (US 2004/0038388 A1 published Feb. 26, 2004).
 4. Claim 65 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Mathies in view of McNeely, Quake, and Klaerner (US 2002/0001845 A1 published Jan. 3, 2002).
 5. Claim 67 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Mathies in view of McNeely, Quake, and Zare (US 2003/0062310 A1 published Apr. 3, 2003).
 6. Claims 78-90, 93, 94, 96, 97, and 106-110 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mathies in view of McNeely, Quake, and Werner (US 2002/0168652 A1 published Nov. 14, 2002).
 7. Claims 91 and 98-105 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mathies in view of McNeely, Quake, Werner, and Christel (US Patent 6,368,871 B1 issued Apr. 9, 2002).

² Though claim 47 is not listed in the Examiner's statement of rejection (Ans. 12), the Examiner clearly rejects the subject matter of claim 47 over Schembri's Figure 2 that teaches a three-dimensional probe array (Ans. 13). Accordingly, this oversight in listing the claims is harmless error.

8. Claims 92 and 95 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mathies in view of McNeely, Quake, Werner, and Regnier (US Patent 6,156,273 issued Dec. 5, 2000).

Appellants argue only claim 1 of rejection (1) (App. Br. 4-12). With regard to rejections (2) through (8), Appellants refer to arguments made regarding claim 1 (App. Br. 11-12). Therefore, the claims under rejections (2) through (8) stand or fall with our assessment of claim 1.

DISPOSITIVE ISSUES

1. Did the Examiner reversibly err in finding that the teachings of Mathies, McNeely and Quake, as a whole, would have suggested using a microchannel depth of “from about 1 micron to less than 10 microns” as required by claim 1? We decide this issue in the negative.
2. Did the Examiner reversibly err in finding that the evidence in favor of obviousness outweighs Appellants’ evidence of secondary considerations? We decide this issue in the negative.

FACTUAL FINDINGS (FF) & ANALYSIS

ISSUE (1)

Appellants argue that McNeely’s teaching that the microarray channels be at least about 15 μm deep and most preferably 25 μm deep teaches away from Quake’s about 2 to about 4 or 5 microns deep microchannels (App. Br. 7). Appellants argue that McNeely’s teaching that reducing the chamber height causes problems underscores the teaching away

(App. Br. 7). Appellants contend that McNeely's disclosure further teaches away from the claimed invention which requires a microchannel depth between about 1 micron to less than 10 microns (App. Br. 7-8).

Appellants further contend that the Examiner failed to consider the references in their entirety and thus did not appreciate McNeely's argued teaching away (App. Br. 8). Appellants argue that the Examiner's justification for combining the teachings of Mathies, McNeely, and Quake is based upon impermissible hindsight (App. Br. 8).

However, as aptly stated by the Examiner, McNeely's teachings regarding the microchannel height are tied to using a gasket to seal the main interface layer 617 to the microarray slide (Ans. 25). The Examiner further finds that McNeely recognizes that smaller reaction chamber volumes are desirable but the height of the gasket limits the depth of the channel (Ans. 26).

Indeed, McNeely discloses embodiments that attempt to circumvent the gasket height and surface roughness limitations by partially backfilling the chamber formed by the main interface layer, the gasket, and the microarray with an immiscible fluid or a fluid that solidifies so as to occupy a portion of the chamber and thereby decrease the height and volume of the chamber (McNeely, para. [0137]). In other words, the teachings of McNeely indicate a preference for smaller microchamber heights and volumes, but are limited by the sealing method used (i.e., the gasket).

Quake teaches that the base substrate having the microchannels is covered and sealed with a transparent cover layer (Quake, col. 24, ll. 64-67). The Examiner finds, and Appellants do not dispute, that Quake does not teach using a gasket to seal the cover plate to the base plate (Ans. 26 and

27). Quake's microchannels have a depth of about 2 to about 4 or 5 microns as found by the Examiner (Ans. 8 and 26; Quake, col. 24, ll. 47-49).

Appellants do not specifically dispute the Examiner's findings regarding what Mathies teaches (App. Br. 4-12). We adopt the Examiner's findings regarding Mathies as our own (Ans. 5-6 and 27).

Based on these teachings, we agree with the Examiner that the teachings of the references as a whole teach a preference for using smaller microchannel depths and volumes and McNeely's teaching does not constitute a teaching away. In fact, McNeely's teachings indicate a preference for smaller microchannel depths and volumes, but McNeely is limited by the gasket seal used. McNeely does not discourage seeking smaller depths or volumes and even provides an embodiment using backfill in the microchannel in an attempt to achieve the smaller microchannel depths and volumes.

In light of McNeely's teachings of the desirability of smaller microchannel depths and the limitations involved with using a gasket material, one of ordinary skill would have been taught by Quake that a sealed microchannel assembly having microchannel depths between about 2 to about 4 or 5 microns can be formed without a gasket. Therefore, we, like the Examiner, agree that it would have been *prima facie* obvious to use McNeely's microarray in microchannels with a depth of about 2 to about 4 or 5 microns as taught by Quake in Mathies' microfluidic device for the reasons of record (Ans. 6-8).

Contrary to Appellants' arguments, the Examiner's reasons for modifying Mathies are not based upon impermissible hindsight. Rather, the Examiner relies on the teachings of the references to provide the reasons for

the proposed modification (Ans. 7-8). The Examiner has considered the references in their entirety and based on the teachings contained therein, we agree with the Examiner that the claimed invention would have been prima facie obvious in light of the combined teachings of Mathies, McNeely and Quake.

ISSUE (2): SECONDARY CONSIDERATIONS

Appellants contend that the evidence contained in the Declaration of co-inventor Jason A.A. West filed March 25, 2008 (hereinafter the West Declaration) demonstrates unexpected results because the probe hybridization and detection time of Appellants' claimed invention is about 5 minutes while the prior art probe hybridization and detection is typically performed "overnight" (i.e., approximately 8 hours) (App. Br. 9). Appellants contend that this demonstrates a 96-fold improvement in probe hybridization and detection times (App. Br. 9).

Appellants further contend that the West Declaration and Exhibit C in the Evidence Appendix of the Appeal Brief demonstrate that Appellants' claimed invention addresses a long-felt need in the art for shorter processing times (App. Br. 10).

The Examiner determines that Appellants' evidence in the West Declaration is not probative of nonobviousness because it fails to compare the claimed invention with the closest prior art. Instead, the Examiner finds that the West Declaration states that the claimed invention produced superior results when compared to "alternative devices in the field" (Declaration 2; Ans. 28). We agree.

Though Appellants contend that a comparison has been made between the microfluidic device of McNeely (i.e., the closest prior art according to Appellants) (App. Br. 10; Reply Br. 6), the West Declaration merely states that the comparison was made between the claimed invention and “alternative devices in the field.” Appellants do not state that the McNeely device was, in fact, one of the devices compared in the West Declaration or shown in Exhibit B. Appellants’ mere attorney argument as such is insufficient to establish such a comparison has in fact been made and that the evidence establishes unexpected results over the applied art.

Regarding Appellants’ long-felt need argument, Appellants must establish that the problem was a persistent one that was recognized by those of ordinary skill in the art. *In re Gershon*, 372 F.2d 535, 539 (CCPA 1967). However, the only evidence of recognition of a problem in the art is an article co-authored by two of the co-inventors and three others that the amount of time may be a drawback (Exhibit C attached to the West Declaration and the Evidence Appendix). Also, such evidence merely establishes that Appellants first recognized the problem, not that it was a persistent problem recognized by those of skill in the art. Appellants’ Exhibit C evidence is simply insufficient to establish that the claimed invention satisfied a long-felt need in the art.

Therefore, weighing the evidence of non-obviousness with the evidence of obviousness, we agree with the Examiner that the preponderance of the evidence weighs in favor of obviousness. We affirm the Examiner’s § 103 rejections (1) through (8).

DECISION

The Examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

ORDER

AFFIRMED

bar

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